Z-CARD II™

THE COMPLETE HARDWARE AND SOFTWARE WITH CP/M-80™
OPERATING SYSTEM FOR THE APPLE II®, APPLE II PLUS® OR APPLE IIe®

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PREFACE

This manual is intended to teach you how to operate your Z-Card II. It assumes that you have access to an Apple II, Apple II Plus, or Apple IIe, and that you are familiar with its operation. It also assumes that you have access to the other documentation provided with your Z-Card II.

Section 1 introduces the product and gives a brief definition of the hardware, software, and technical manuals that it includes. This section tells you how to install the Z-Card II and explains the conventions we use in this manual to describe commands and operation.

In section 2, fundamentals of the CP/M-80, Rev. 2.2 operating system are discussed. This section describes system initialization, the procedure for making back-up diskettes, and the CP/M operating system commands.

Section 3 includes individual descriptions of the utilities supplied by Advanced Logic Systems to supplement the CP/M software. In addition, the details of operating each utility program are provided.

This manual is written for Z-Card II CP/M software version 2.2.2. Advanced Logic Systems welcomes your suggestions for new material to include in the next revision of our documentation.

1

INTRODUCTION AND INSTALLATION

1.1 Introduction

The purpose of this section is to introduce you to the Z-Card II, a product of Advanced Logic Systems. You will receive complete instructions for installing the product in your Apple II series computer system. In addition, you will learn the general function of the hardware and software components. At the end of this section, you will find a description of the conventions we used to describe Z-Card II commands and operation.

We recommend that you read this manual completely before attempting to install and operate our product. In addition, you should be familiar with Apple II documentation. DO NOT install the Z-Card II before reading the installation instructions in sections 1.9 through 1.9.3 of this manual.

The Z-Card II is composed of a printed circuit card, a diskette containing computer software, and a set of technical manuals. Its purpose is to give you a more versatile and powerful Apple computer system.

1.2 Product Inventory

Take an inventory of the contents of your Z-Card II package. You will find the following items:

- A Z-Card II printed circuit card
- A Z-Card II software diskette with CP/M, ALS Rev. 2.2.3
- This Z-Card II User's Manual

Verify that each item listed above is included in your Z-Card II package. In addition to these items, you will find four documents dealing with licensing, registration, and warranty. They will be discussed later in this section.

1.3 Z-Card II Hardware

Z-Card II hardware consists of a printed circuit card that contains a Z-80A microprocessor. It contains the circuitry required to run the CP/M operating system. Figure 1-1 shows a Z-Card II ready for installation.

Installing the Z-Card II in your computer system will not affect or diminish in any way the capabilities of your Apple II system under other operating systems. Your Apple II will continue to function exactly as before with DOS, Apple Pascal, and game software, providing that the Z-Card II software diskette is not loaded.

1.4 Software Components

Z-Card II software is composed of the Z-Card II CP/M operating system with ALS BIOS, utilities from Digital Research, Inc., and utilities supplied by Advanced Logic Systems.

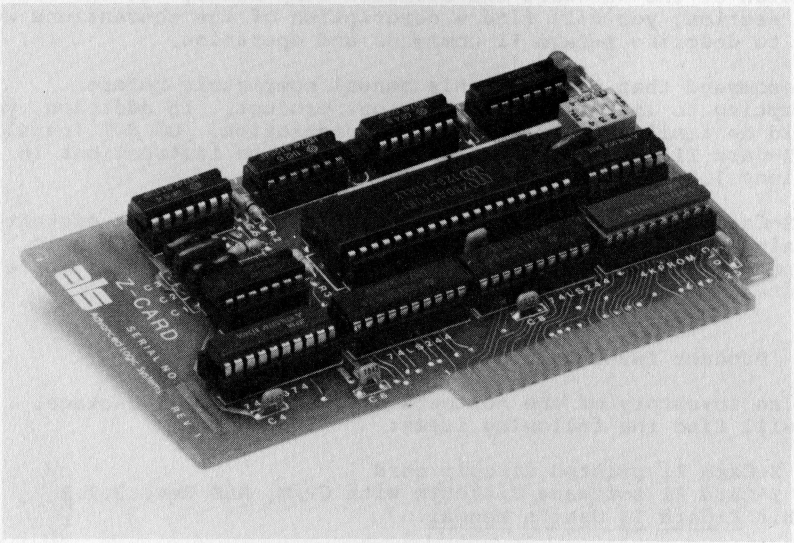

Figure 1-1 The Z-Card II

1.4.1 CP/M Operating System

CP/M (Control Program for Microprocessors) is a widely-used operating system for Z-80 based computer systems. Installation of CP/M on your Apple II means a broad new range of over 3,000 applications programs are open to you. Especially noteworthy are the business management and word processing programs that run with CP/M.

1.4.2 Advanced Logic System Utilities

The majority of utilities from Advanced Logic Systems are designed to make using your CP/M operating system more convenient. Most are menu-driven programs that let you accomplish complex file and system management by simply selecting a menu option. Section 3 gives a detailed description of these utilities.

1.5 Technical Manuals

The technical manuals included with your Z-Card II explain its features in a complete, understandable manner. Keep your manuals near your Apple II for ease of reference.

1.5.1 Z-Card II User's Manual

This manual explains Z-Card II installation and operation. In addition, it contains general information about Z-Card II usage and individual software descriptions for Advanced Logic System utilities.

1.5.2 LATEST.DOC Documentation Update File

A text file named LATEST.DOC is included on your Z-Card II software diskette. It includes a description of changes and additions to Z-Card II hardware and software that have occurred since the last revision of our technical manuals. LATEST.DOC is displayed on the monitor screen by using the HELP command. See section 3.8 for detailed information.

1.5.3 Additional Documentation

For detailed information on the inner structure of CP/M 2.2, the CP/M Operating System manual can be purchased from Digital Research, Inc., Pacific Grove, California. In addition, a complete list of CP/M applications software is available from Digital Research, Inc.

1.6 Licensing and Registration

After you have installed your Z-Card II, please take some time to read the documents that are supplied with the product. These documents include:

- A Digital Research Licensing Agreement
- A Digital Research Registration Card
- An Advanced Logic Systems Licensing Agreement
- An Advanced Logic Systems User Warranty/Registration card

After you have read the Digital Reasearch and Advanced Logic System licensing agreements, please complete the Digital Research and Advanced Logic System registration cards and return them. These registrations put your warranty in effect and place you on our mailing list for update information.

1.7 Warranty

Advanced Logic Systems ("ALS") warrants to the original user of this product that it shall be free of defects resulting from faulty manufacture of the product or its components for a period of ONE YEAR from the date of purchase. ADVANCED LOGIC SYSTEMS MAKES NO WARRANTIES, EXPRESS OR IMPLIED, REGARDING EITHER THE SATISFACTORY PERFORMANCE OF THIS PRODUCT OR THE FITNESS OF THE SOFTWARE FOR ANY PARTICULAR PURPOSE. Defects covered by this Warranty shall, at the option of Advanced Logic Systems, be corrected either by repair or replacement. In the event of replacement, the replacement unit will be warranted for the remainder of the original ONE YEAR period or thirty (30) days, whichever is longer.

If this product should require service, return it, postage prepaid, to Advanced Logic Systems, Inc., 1195 East Arques Avenue, Sunnyvale, California 94086, along with an explanation of the suspected problem.

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1.8 Conventions of this Manual

An important part of learning to successfully operate your Z-Card II is understanding the conventions we used to describe Z-Card II commands. These conventions are described below.

1. Commands are shown in upper case letters.

2. A hyphenated command indicates that the characters to the left and right of the hyphen are pressed simultaneously.

   For example, the command represented as:

   CTRL-C

   means that you should press the key marked CTRL (or CONTROL on the Apple IIe) and C simultaneously. Please note that the program messages displayed on your monitor screen represent the CTRL key as an up-arrow (^). "CTRL-C" and "^C" have identical meanings.

3. The characters "(cr)" represent the key marked RETURN on your Apple keyboard. This key operates like a carriage return on a typewriter. It signals the computer that you have completed a command. For example, the command represented as:

   DISCOPY (cr)

   indicates that you should type the word DISCOPY and press the key labelled RETURN. The space that separates (cr) from the command is there to increase legibility and should not be typed.

4. Extra spaces have been inserted in commands involving the CTRL and ESC keys. These spaces are shown to increase legibility and should not be typed as part of the command.

1.9 Z-CARD II INSTALLATION

1.9.1 Installation Requirements

The Z-Card II is an expansion for the Apple computer system. As such, it requires the following list of equipment to function.

- An Apple II, Apple II Plus, or Apple IIe computer system equipped with 48K RAM
- Two Apple Computer Disk II equivalent disk drives
- A video monitor

We suggest a Smarterm II or Smarterm 80-column video card and a printer (with appropriate Advanced Logic System interface) if you intend to use word processing, accounting, and business applications software currently available.

1.9.2 Peripherals and Slot Usage

The Z-Card II implementation of CP/M follows protocols established by Apple Computer, Inc. for use with their Pascal 1.1 system. The firmware protocol, as it is called, is designed to allow future revisions of various operating systems (such as CP/M) to be independent of system slot usage.

The Apple II and Apple II Plus have eight peripheral slots located at the back of their motherboards (see figure 1-2). Slot 0 is dedicated for a 16K memory expansion card for a full 64K system. The Apple IIe has only seven peripheral slots at the back of the motherboard, but is manufactured as a 64K system. The Apple IIe peripheral slots are shown in figure 1-3. We recommend the configuration shown in table 1-1 for maximum system flexibility.

NOTE

Do not install the Z-Card II in the Apple IIe's "special" slot. It is reserved for specially designed interface cards.

Table 1-1 Peripheral Slot Usage

Slot Number	Accessory Card	Advanced Logic Systems Product
0	16K memory expansion card (For Apple II and Apple II Plus systems only)	Add-Ram*
1	Printer interface	Dispatcher or PrinterMate
2	General purpose	
3	Console interface.	Smarterm I or II 80-column video card
4	General purpose/ Co-processors	Z-Card II
5	General purpose.	
6	Disk controller.	
7	General purpose/ Specialized video	Color II RGB interface

* On 64K Apple II and Apple II Plus systems, a fully buffered RAM card, like the Add-Ram, should be used with the Z-Card II.

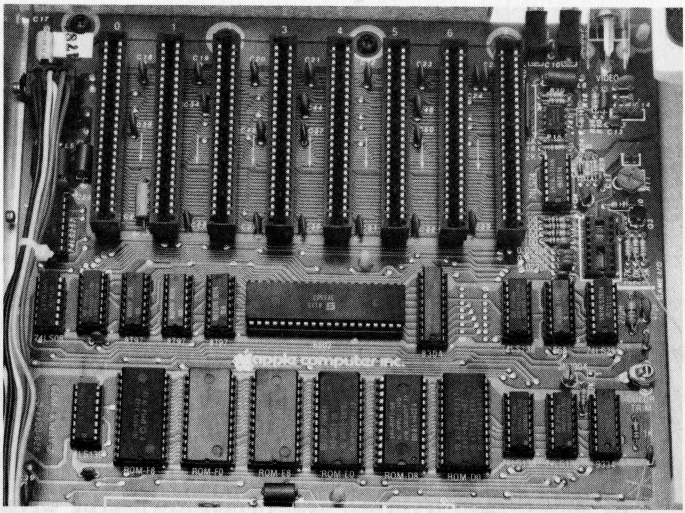

Figure 1-2 Apple II and Apple II Plus Peripheral Slots

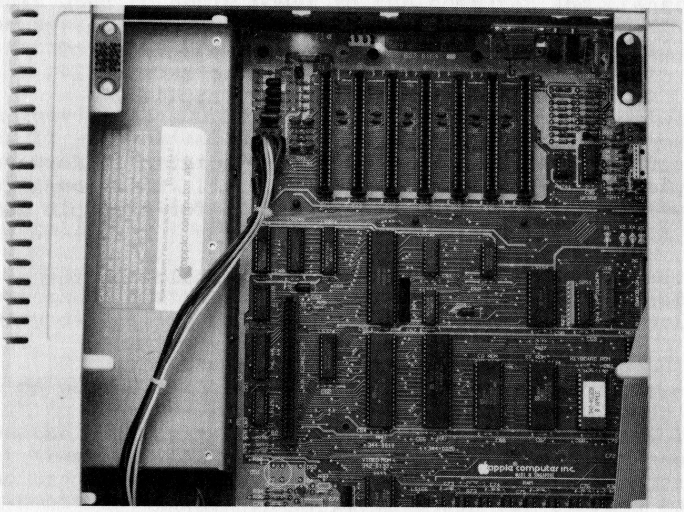

Figure 1-3 Apple IIe Peripheral Slots

1.9.3 Installation Procedure

WARNING

Improper installation of the Z-Card II can result in damage to Apple or Z-Card II hardware.

Follow the procedure shown below to install the Z-Card II in your system.

1. Turn off power to your Apple II or IIe, using the system power switch located at the left rear corner of the computer.

2. Remove the cover of the Apple by pulling up on its back edge until the fasteners are released. Then slide the cover backwards and off.

3. Locate peripheral slot 4 on the Apple motherboard. Remove the Z-Card II from its protective wrapping. Position the Z-Card II above slot 4 with the gold fingers at the bottom. The component side of the card should be to your right as you face the Apple II from the keyboard side. Insert the fingers of the Z-Card II into the peripheral slot with a steady, even pressure. At first you will feel some resistance from the connector, and then, as the socket opens, the card will seat firmly. Make sure that all fingers are seated in the peripheral slot.

WARNING

Make sure that the card is aligned so that all pins are in the socket. Misalignment of the connector can cause damage to Z-Card II or Apple hardware when power is applied.

4. Replace the cover to the Apple II by sliding it forward and snapping it back into place at the rear. This completes the hardware installation of the Z-Card II for an Apple computer with 48K of computer memory.

You are ready to insert the CP/M diskette following the instructions in section 2.

2

FUNDAMENTALS OF CP/M

2.1 Introduction

The purpose of this section is to give an overview of the CP/M operating system as it is used with the Z-Card II. You will learn how to bring up the system in CP/M and how to perform a "warm boot". You will make a back-up diskette of your Z-Card II software and see examples of the most important CP/M file management commands.

2.2 Initializing the System

The process used to apply power to the computer and transfer an operating system into computer memory is called system initialization. Another phrase commonly used to refer to this process is performing a "cold boot".

When you initialize your system using the Z-Card II software diskette, it automatically performs an additional function. The operating system executes the HELLO program. It provides you with a listing of all files contained on the diskette and gives you a menu of operations for your selection. Initialize your system by following the steps given below.

1. Insert the diskette containing Z-Card II software into your primary disk drive unit, but do NOT close the disk drive latch.

2. Turn on power to the monitor, printer, and Apple II.

3. Close the disk unit latch. You should hear the disk turning as it transfers the operating system into computer memory. If no transfer occurs, one of three prompts will appear on your monitor screen. These prompts and the command to be typed for each follow. The type of system that corresponds to each prompt is shown in parentheses.

Prompt	Command	
*	6 CTRL-P (cr) or 6 CTRL-K (cr)	(for Apple II without AUTOSTART ROM)
>	PR#6 (cr)	(for Apple II with Integer Basic ROM)
]	PR#6 (cr)	(for Apple II Plus with Applesoft Basic ROM)

After a successful system initialization, the monitor screen clears and displays the message:

```
                    THE Z-CARD II
          { 48K CP/M 2.2.2 for the Apple II }
                 Copyright <c> 1983
               Advanced Logic Systems

        THE FOLLOWING PROGRAMS ARE ON THIS DISKETTE:

A: ADUMP     BIGSYS  DISCOPY  ED     HELP    MON65   STAT    WSMAKER
A: APPMAKER  CAT     DUMP     HELLO  LOAD    PIP     SUBMIT  XSUB
A: ASM       DDT
```

```
                    OTHER FILES ON DISK:

A: DUMP   .ASM  : LATEST  .DOC

YOU HAVE THE FOLLOWING OPTIONS:

    1.  EXECUTE ONE OF THE ABOVE LISTED PROGRAMS
    2.  BACKUP YOUR DISKETTES
    3.  DISPLAY HELP MESSAGES
    4.  EXIT TO CP/M

    YOUR CHOICE?
```

The A: appearing on the left side of the screen in front of each row of file names is the CP/M name for disk drive 1. The rest of the information constitutes the Z-Card II initialization message, which the HELLO program automatically sends to the screen during a "cold boot". Your screen display may be slightly different due to changes to the Z-Card II software package or additions to the HELLO menu of options. If you do not see this screen display (or a very similar one) after a few seconds, open the disk unit latch, and turn off the computer and peripherals. Check that the Z-Card II has been installed properly and that all connections are correct.

The first thing that you should do after you have initialized the system is make a back-up copy of the Z-Card II software diskette. Please refer to section 2.3 for directions.

2.3 Making a Back-up Diskette

Copy your Z-Card II software diskette by using option 2 of the HELLO menu of operations according to the directions given below.

1. If you have just performed a system initialization, your Z-Card II software diskette is located in your primary disk drive (A:), and you should see the HELLO menu of operations on your monitor screen:

   ```
   YOU HAVE THE FOLLOWING OPTIONS:

   1.  EXECUTE ONE OF THE ABOVE LISTED PROGRAMS
   2.  BACKUP YOUR DISKETTES
   3.  DISPLAY HELP MESSAGES
   4.  EXIT TO CP/M

   YOUR CHOICE?
   ```

   Insert a BLANK diskette in your secondary disk drive unit (B:), making sure that the diskette is not write-protected. (The notch in the upper right corner of the diskette should be uncovered.) Then, select option 2 by typing:

   ```
   2
   ```

2. The transfer program, DISCOPY, will load into computer memory and display this menu on the monitor screen:

   ```
   ALS DISCOPY
   THIS PROGRAM COPIES FROM DRIVE A: TO DRIVE B:


     1.  FORMAT AND COPY ENTIRE DISKETTE FROM DRIVE A: TO B:
     2.  CREATE FORMATTED BLANK DISKETTE ON DRIVE B:
     3.  COPY SYSTEM TRACKS FROM DRIVE A: TO B:
     4.  VERIFY A FORMATTED DISKETTE ON DRIVE B:
     5.  EXIT TO CP/M

   SELECT YOUR OPTION:
   ```

3. Select option 1 by typing:

   ```
   1
   ```

   DISCOPY prints the message:

   ```
   ***WARNING*** ANY FILES YOU MAY HAVE ON DISK B: WILL BE
   ERASED!

   READY? (Y/N/^C):
   PRESS ANY KEY TO STOP THE COPY OPERATION
   ```

4. Begin the copy operation by typing:

   ```
   Y (cr)
   ```

After DISCOPY completes the transfer, it again displays the DISCOPY menu.

5. Return to the CP/M operating system level by typing:

   5 (cr)

   Remove the master Z-Card II software diskette from the primary disk drive and store it in a safe place. Place the copy diskette in the primary disk drive and type CTRL-C.

6. If your Apple computer is equipped with 64K bytes of computer memory, execute the Advanced Logic Systems BIGSYS program as described in section 3.4.

Using your working copy of Z-Card II software, you are ready to explore the CP/M operating system.

2.4 CP/M Operating System Prompt

Option 4 of the HELLO menu of operations gives system control to the CP/M operating system. The prompt associated with CP/M is a greater than sign (>) preceded by the CP/M name for the logged disk drive unit. On an Apple II with two disks, CP/M will display either A> or B> when it is active. These prompts indicate that CP/M is ready to accept a command from the Apple II keyboard.

2.5 Performing a Warm Boot

Now that you know how to start your CP/M system, you need to know how to reset the system software. A reset asks the operating system to re-read the disk directories and re-log that information into computer memory. This process is called a "warm boot" and is accomplished by typing:

CTRL-C

Normally, you must perform a warm boot each time you change a diskette in one of the drives or open a disk drive latch. Otherwise, when you try to write on the diskette, CP/M will return the error message "BDOS ERROR ON A: R/O" or "BDOS ERROR ON B: R/O". (The R/O means Read/Only.) There is one exception to this rule, however. Never perform a warm boot after inserting a new, unformatted diskette in a disk drive.

2.6 Disk Drive Allocations

CP/M identifies the disk drives of your Apple II in alphabetical order, followed by a colon. The primary disk drive is drive A:. The second drive is drive B:, etc. The drive unit that CP/M is currently logged on appears as the first character of the system prompt. For example, A> indicates that CP/M is logged on the

primary disk drive. To change the logged drive to a second disk drive, type:

B: (cr)

Assuming that a CP/M formatted diskette is in drive B:, you will see the operating system prompt change to B>. Otherwise, you will receive a BDOS error message. In section 2.7, you will see how to load a program from another disk drive, without changing from the currently logged drive unit.

2.7 CP/M File Names

CP/M filenames are up to eight characters long, usually followed by an extension code of up to three characters. The filename and extension code are separated by a period (.). For example, an executable program called EXAMPLE would be identified as EXAMPLE.COM. If the file is not located on the currently logged disk, you would specify the disk drive name when you execute the file:

B:EXAMPLE (cr)

NOTE

> CP/M converts keyboard commands issued in lower case to upper case. You may type b:example.com to refer to a program called B:EXAMPLE.COM by the system.

File names can include letters, numerals, and some symbols. The symbols that can not be used are <>.,:=;*?[]. The extension .COM is reserved for executable command files. In addition, .BAK is often used by the system and application programs to denote a file back-up. Do not use the .BAK extension in naming original files.

A convenient use of the extension is as a means for dating files. For example, LETTER.602 could refer to a file named LETTER created on June 2.

2.8 CP/M File Management Commands

There are five built-in commands in the CP/M system. They are DIRectory, ERAse, RENname, SAVE, and TYPE. Brief overviews of DIR, ERA, REN, and TYPE are given below.

2.8.1 DIR

DIR is the command used to list the directory of a diskette. DIR provides a list of all files on a disk drive, some of the files, or a single file. Two wild card characters, the question mark (?) and asterisk (*) are available. The question mark in any position will cause display of all files with any character in

that position. The asterisk will display all files with any character in all positions to the right of the asterisk.

Examples:

DIR
Show all files on the current drive.

DIR B:
Show all files on drive B:.

DIR *.COM
Show all files with the extension .COM.

DIR LETTER.A??
Show any file called LETTER with an extension that begins with .A.

2.8.2 REN

REN is the command used to rename a file. Some examples of its use are shown below.

Examples:

REN FILENAME.NEW=FILENAME.OLD
Changes the old filename to the new filename on the current disk drive.

REN B:FILENAME.NEW=B:FILENAME.OLD
Changes the name of FILENAME.OLD to FILENAME.NEW on disk B:.

2.8.3 ERA

ERA is the command used to erase (delete) a file from the diskette. The wild cards available in the DIR command (?,*) are also available to ERA, permitting the erasure of many files at once.

Examples:

ERA FILENAME.EXT
Erases one file on the currently logged diskette.

ERA FILENAME.*
Erases all files with the name FILENAME on the currently logged diskette.

ERA FILENAME.A??
Erases all files called FILENAME having an extension beginning with A from the currently logged disk.

ERA B:*.BAK
Erases all back-up files from drive B:.

ERA *.*

Erases all files from the currently logged disk. The system will ask "ALL FILES (Y/N)?" for your protection. Use this command with great caution.

2.8.4 TYPE

TYPE is the command used to transfer text files from disk to the monitor or printer without formatting. Its function is similar to the DOS LIST command.

Examples:

TYPE FILENAME.TXT

Lists a file on the current disk drive to the monitor screen.

TYPE B:FILENAME.TXT

Lists a file on drive B: to the monitor screen.

CTRL-P
TYPE FILENAME.TXT

Lists a file on the currently logged disk drive to the printer and monitor screen.

2.9 CP/M Comparison with DOS

Table 2-1 lists some of the CP/M commands that you have encountered in this section and their approximate DOS 3.3 equivalents. You will find that not all CP/M and DOS commands are identical in function. However, we include them in order to give those of you who are familiar with DOS a convenient reference point for learning CP/M.

Table 2-1 CP/M Comparison with DOS

CP/M	DOS
A> DIR	] CATALOG
A> DIR B:	] CATALOG, D2
A> REN NEWNAME.EXT=OLDNAME.EXT	] RENAME OLDNAME, NEWNAME
A> ERA FILENAME.EXT	] DELETE FILENAME
A> PROGRAM	] RUN PROGRAM
A> B:PROGRAM	] RUN PROGRAM, D2
A> Cold boot (reset)	] PR#6
A> CTRL-C	Not applicable

3

ADVANCED LOGIC SYSTEM UTILITIES

3.1 Z-Card II Commands for Use With CP/M

In addition to the CP/M operating system and associated utilities from Digital Research, the Z-Card II software diskette contains several programs prepared by Advanced Logic Systems. These programs are designed to make using CP/M more convenient for Apple II owners. This section describes the Advanced Logic System utility programs that are part of the Z-Card II software package.

3.2 ADUMP

The ADUMP program displays data stored on diskette in hexadecimal and ASCII formats. The ADUMP menu of options allows a programmer to examine disk data for a total file or for a single sector of a file. The data is given in sixteen-byte lines preceded by the absolute byte address. The corresponding ASCII characters are printed to the right of the data display as shown in figure 3-1.

To execute ADUMP follow the steps given below.

1. Insert the Z-Card II software diskette in drive A:.

2. Insert the diskette you wish to examine in drive B:.

3. Execute the program by typing:

ADUMP B:FILENAME.EXT (cr)

NOTE

If the system is logged on the drive containing the diskette to be examined, there is no need to precede the filename with the disk drive name. For example:

ADUMP FILENAME.EXT (cr)

The screen displays the ADUMP menu of options including the following:

1. DUMP ENTIRE FILE
2. DUMP SINGLE SECTOR
3. EXIT TO CP/M

TYPE SELECTION (1-3)

4. Select an option by typing the number corresponding to it. If option 1 is selected, the program displays all sectors in hexadecimal and ASCII formats. The display can be interrupted with CTRL-S for examination. Press the spacebar to return to the ADUMP menu of options.

   When option 2 is selected, the program requests:

   WHAT SECTOR NUMBER (IN HEX)?

   Enter the sector number in hexadecimal format followed by (cr). The sector data will then be displayed.

   Select option 3 to exit from the ADUMP program and return system control to the CP/M operating system.

```
     SECTOR #   00 01
0080  75 69 72 65 73 20 66 69 6C 65 20 73 0D 61 72 74 uires file swart
0090  65 72 6D 2E 62 69 6E 20 74 6F 20 61 73 73 65 6D erm.bin to assem
00A0  62 6C 65 0D 0A 3B 20 30 36 2F 31 34 2F 38 32 20 ble..; 06/14/82
00B0  61 64 64 65 64 20 27 6E 6F 20 6D 65 6E 75 27 20 added 'no menu'
00C0  6F 70 74 69 6F 6E 20 66 6F 72 20 38 30 20 63 6F option for 80 co
00D0  6C 75 6D 6E 20 28 7A 65 72 6F 20 69 6E 20 66 69 lumn (zero in fi
00E0  72 73 74 20 62 79 74 65 29 20 50 41 54 0D 0A 0D rst byte) PAT...
00F0  0A 3B 54 48 49 53 20 50 52 4F 47 52 41 4D 20 45 .;THIS PROGRAM E
```

Figure 3-1 ADUMP Data Display

3.3 APPMAKER

This program creates a working disk for an applications program or a file disk. APPMAKER formats a diskette and automatically places the Z-Card II software most often used in conjunction with an applications program on the diskette. The CP/M operating system, HELLO, CAT, DISCOPY, and PIP are placed on the application diskette. Execute APPMAKER by following the procedure shown below.

1. Insert the Z-Card II software diskette in drive A: and a blank diskette in drive B:. Give system control to the CP/M operating system. (You should see the CP/M prompt (>) sign on the monitor screen.)

2. Execute the APPMAKER program by typing the command:

   APPMAKER (cr)

   The program will display the message:

   ALS USER DISK UTILITY

   PLACE A BLANK DISKETTE IN DRIVE B:

   PROGRAM IS READY TO FORMAT AND COPY

   WARNING ANY FILES YOU MAY HAVE ON DISK B: WILL BE ERASED!

   ARE YOU READY (Y/N/^C):

3. Respond positively by typing:

   Y (cr)

4. After the transfer is complete, remove the Z-Card II software diskette from drive A:, and replace it with the utility diskette from drive B:.

5. Place the diskette containing your applications program in drive B:, and re-initialize system software by typing:

   CTRL-C

6. Transfer your applications program to the utility diskette by typing:

   PIP A:=B:*.*[V] (cr)

Translated freely, this command means: "copy into A: from B: all files and verify the copy operation". Remember that the brackets surrounding V are not available on all Apple keyboards and must be obtained through an 80-column video card using special keystroke sequences.

After your applications program is copied and verified, place the original applications diskette in a safe place with your other original diskettes. Use the utility diskette in drive A: as your new working master.

3.4 BIGSYS

The BIGSYS program reconfigures the 48K version of software supplied with the Z-Card II for Apple II computers with 64K memory. BIGSYS is executed according to the following procedure:

1. Initialize the system with the Z-Card II software diskette in the primary disk drive (drive A:).

2. Insert a diskette in drive B:, making sure that it is not write-protected. You can use a blank unformatted diskette or a diskette that contains data that you no longer wish to keep.

3. From the operating system level, type the program name:

    BIGSYS (cr)

The BIGSYS program automatically formats the diskette in drive B:, creates a 64K operating system, and copies all files on the diskette. On completion, BIGSYS gives system control to the CP/M operating system, and the CP/M prompt (>) is displayed. The diskette in drive B: is ready for use as the 64K version of the operating system. To boot this new diskette and use the expanded RAM system, place the diskette in drive A: and press RESET.

3.5 CAT

The CAT program displays diskette directories in alphabetical order. Additionally, it displays the size of each file on the directory and the space remaining on the diskette. The CAT command is an enhancement of the CP/M DIR command and obeys all the options for DIR described in and in section 2.8.1 of this manual.

Examples:

CAT

Displays the directory of the currently logged drive.

CAT B:

Displays the directory of drive B:.

CAT *.COM

Displays all files with a .COM extension on the currently logged disk.

3.6 DISCOPY

The DISCOPY program formats and copies diskettes in a single operation. This program will permit copying on the diskette in drive B: only. DISCOPY is a menu-driven program with five options. Option 1 formats the diskette in drive B: and copies the entire contents of the drive A: diskette to drive B:. Option 2 formats the diskette in drive B: and copies the operating system only. Option 3 copies the operating system from drive A: to the drive B: diskette. Other files stored on the drive B: diskette are kept intact. Option 4 verifies a formatted diskette on drive B:, and option 5 exits the DISCOPY program and returns to CP/M.

Although DISCOPY is a CP/M program, it will copy any 16-sector diskette that is not copy-protected. Therefore, you can use DISCOPY on Apple DOS 3.3 and Pascal formatted diskettes. Execute DISCOPY by following the procedure shown below.

1. Initialize the system and place the diskette containing DISCOPY in drive A:.

2. Type the command:

   DISCOPY (cr)

   The DISCOPY program will be loaded into computer memory and then display the message:

```
ALS DISCOPY
THIS PROGRAM COPIES FROM DRIVE A: TO DRIVE B:


1.  FORMAT AND COPY ENTIRE DISKETTE FROM DRIVE A: TO B:
2.  CREATE FORMATTED BLANK DISKETTE ON DRIVE B:
3.  COPY SYSTEM TRACKS FROM DRIVE A: TO B:
4.  VERIFY A FORMATTED DISKETTE ON DRIVE B:
5.  EXIT TO CP/M


SELECT YOUR OPTION:
```

3. Insert the source diskette in drive A: and a blank or scratch diskette in drive B:.

4. Type the number corresponding to the operation you wish to complete followed by a carriage return. Each option displays prompting messages to guide you through the option. Please note that options 1 and 2 destroy all files residing on the diskette in drive B: in the course of their operation. All options ask for confirmation before starting by displaying the message:

   READY? (Y/N/^C):

Type Y (cr) to begin the operation. Typing N (cr) terminates the program and returns control to the CP/M operating system. CTRL-C performs a warm boot and returns to the operating system.

5. After an option has been completed, DISCOPY again displays its menu. Select option 5 when you wish to return to the CP/M operating system level.

3.7 HELLO

The HELLO program is called by the operating system during system initialization. HELLO automatically executes the following functions:

- Loads the drivers for the Smarterm I high performance console.
- Displays the contents of the logged disk in a user-oriented format.
- Provides a menu of operations currently available to the operator.

3.7.1 High Performance Console Features

The high performance console increases system operating efficiency by providing faster, more efficient monitor screen displays. HELLO automatically loads these features for systems that include the Smarterm I card.

Secondly, an audible key click feature can be activated to accompany keystrokes issued from the keyboard. An audible click is generated for every keystroke. This feature is valuable to users of the typeahead buffer. When the buffer is full, the clicks will stop, signaling the operator to stop typing. The key click feature is activated and deactivated by a CTRL-V command issued at the operating system level. (The > prompt is displayed on the monitor screen.)

3.7.2 HELLO Directory and Menu

HELLO automatically displays the contents of the logged disk in a user-oriented format. All executable (.COM) files are displayed first in alphabetical order. Secondly, an alphabetical listing of the remaining files and their extensions is given. Finally, a menu of operations currently available is provided. Menu options include:

1. EXECUTE ONE OF THE ABOVE LISTED PROGRAMS
2. BACKUP YOUR DISKETTES
3. DISPLAY HELP MESSAGES
4. EXIT TO CP/M

If option 1 is selected, the program requests the program name. Type your program choice, and the program will execute automatically. Option 2 calls the DISCOPY utility, a menu-driven

program that provides a convenient means of making diskette back-ups. Option 3 automatically displays the documentation update file, LATEST.DOC, and option 4 gives system control to the CP/M operating system, which then displays the operating system prompt (>).

3.8 HELP

The HELP program is used in conjunction with the LATEST.DOC text file to inform you of changes and additions to the Z-Card II software package. HELP provides an easy means of displaying documentation updates contained in the LATEST.DOC file on the monitor screen.

LATEST.DOC is a text file that contains software descriptions for newly released and newly modified Z-Card II software. This file permits distribution of new utilities and software enhancements in advance of revision of our technical documentation. In addition, it includes information about operation with other hardware and software products. LATEST.DOC gives a summary of all modifications and additions to Z-Card II software that are not yet included in the technical manuals provided with the Z-Card II.

3.8.1 Monitor Screen Display

To display update information on your monitor screen, execute HELP from the CP/M operating system level by typing the command:

```
HELP (cr)
```

HELP displays the "first page" of LATEST.DOC information. Type (cr) to advance to the next page of LATEST.DOC information.

You may return to the operating system by typing X to exit the HELP program.

3.8.2 Printing LATEST.DOC

We suggest that you print a copy of the LATEST.DOC file and store it with your other Z-Card II documentation. To obtain a paper copy, follow the procedure shown below.

1. From the CP/M operating system level, direct CP/M to send information to the printer and monitor using a CTRL-P. Then print the update information. Type the command sequence:

   ```
   CTRL-P
   TYPE LATEST.DOC (cr)
   ```

   A copy of the LATEST.DOC text file will be sent to your printer.

2. Turn off listing to the printer by typing:

   ```
   CTRL-P
   ```

3.9 MON65

This utility gives the programmer an entrance to the 6502 monitor for program examination and debugging. To execute MON65, use the following steps.

1. Insert the Z-Card II software diskette in drive A:.

2. Type the following command:

   MON65 (cr)

The screen display switches to 40-column mode, and the Apple II monitor prompt sign (*) is displayed.

3. To return control to the CP/M operating system, type:

   CTRL-Y (cr)

MON65 is intended for experienced system programmers.

3.10 WSMAKER

This program does a one-step installation of the WordStar word processing program, a product of MicroPro International. The WSMAKER program automatically performs the installation procedure described in the WordStar manual. In addition, it installs all the enhanced Smarterm I and II features.

If your Apple II is equipped with a Smarterm I video card, the WSMAKER version of WordStar assumes that you will always run the HELLO program before running WordStar. The instructions in section 3.10.1 ensure that HELLO will execute automatically each time you load your WordStar diskette.

During execution, WSMAKER checks peripheral slot 3 to identify which 80-column video card is installed, and adapts WordStar (WS.COM) accordingly. Do not use a WSMAKER-installed WordStar diskette with a different video card than the one that was originally in slot 3 during the WSMAKER installation.

3.10.1 WSMAKER Execution

To produce an applications diskette that takes full advantage of the Z-Card II features follow the steps shown below.

1. Insert the Z-Card II software diskette in drive A: and a blank diskette in drive B:. Perform a warm boot to re-initialize system software.

   Make sure that the system is under operating system control (the A> prompt is displayed on the monitor screen).

2. Create a utility diskette in drive B: by typing the command:

   APPMAKER (cr)

The APPMAKER program displays a cautionary message on the monitor screen and asks for confirmation to create a utility diskette in drive B:. Type Y to indicate that you are ready to create the utility diskette.

APPMAKER transfers the CP/M operating system and a set of file management utilities to the drive B: diskette.

3. After control is returned to the operating system, type the command:

   WSMAKER (cr)

   WSMAKER prints the message that follows on the monitor screen.

```
                    WORDSTARMAKER
              Copyright (c) 1982, 1983
            Advanced Logic Systems, Inc.

THIS PROGRAM WILL READ WSU.COM FROM DISK A: AND PRODUCE AN
ALS VERSION OF WORDSTAR ON DISK B: CALLED WS.COM.

REMOVE THE DISKETTE THAT IS NOW IN THE A: DISK DRIVE AND
INSERT YOUR MASTER DISK CONTAINING WSU.COM IN THE A: DISK
DRIVE.


PRESS RETURN WHEN YOU ARE READY   (PRESS X TO EXIT NOW
WITHOUT DOING ANYTHING)
```

4. Insert the WordStar distribution diskette in drive A: and press (cr). WSMAKER will create a WS.COM file on the utility diskette in drive B:. In addition, it copies the WordStar overlay and message files on the diskette. Use this diskette as your working copy of the WordStar program and store the original WordStar diskette in a safe place.

3.10.2 WSMAKER Modifications

For your reference only, this section describes the modifications made by WSMAKER during installation. Two changes are required to allow WordStar to function with the Z-Card II:

Location	New Value	Function
101	08	Jump around I/O table patches.
102	2D	

The modifications that enable the Smarterm I's console driver special screen controls are shown below.

Location	New Value	Function
ERAEOL:	01	Erase to end of line.
ERAEOL:+1	1D	
LINDEL:	01	Line delete.
LINDEL:+1	06	
LININS:	01	Line insert.
LININS:+1	05	
IVON:	01	Inverse video on.
IVON:+1	0F	
IVOFF:	01	Inverse video off.
IVOFF:+1	0E	

Changes that have been made to the standard installation to make WordStar easier for the first time user are listed below.

Location	New Value	Function
ITHELP:	02	Set the initial help level to suppress the main menu.
NITHLF:	00	Help message at sign-on.
ITITOG:	00	Start with insert mode off.
INITWF:+1	00	Start with justification off.
ITPOPN:	FF	Auto page numbers off.

A

SPECIFICATIONS

The Z-Card II meets the following specifications for hardware and software:

- Provides Z-80A microprocessing on Apple II, Apple II Plus and Apple IIe personal computers.
- Follows Apple II Pascal firmware protocol.
- Allows warm boot without reset.
- Automatically supports 80-column video card and printer configuration.
- Supports 48K Apple II systems.
- Designed for low power consumption.
- Includes CP/M 2.2 operating system and utilities from Digital Research, Inc.
- Provides supplementary utilities and menu-driven user aids from Advanced Logic Systems, including:
  - CAT file management utility that lists alphabetized file names, number of files in the directory, and space remaining on disk.
  - DISCOPY utility for diskette format and copy in one operation.
  - WSMAKER menu-driven utility for automatic WordStar installation.

B

GLOSSARY OF TERMS

This appendix defines the technical terms we use to describe Z-Card II operation. Please note that these definitions are not comprehensive and apply solely to usage within this manual.

ASCII -- American Standard Code for Information Interchange. This code converts the characters and control codes commonly used in data transmission to binary representations.

BIOS -- The basic input/output system which contains instructions for operating peripheral devices, such as the console, printer, and disks.

byte -- A group of bits which consititute the smallest unit of addressable computer memory. Eight bits equal one byte of Apple II computer memory.

character -- A letter, numeral, or symbol that is available on the keyboard.

cold boot -- A widely-used term for system initialization.

CP/M -- Control Program for Microprocessors. The name of the operating system supplied on the ALS software diskette.

CRT -- Cathode Ray Tube. The tube commonly referred to as the "picture tube" or "monitor screen".

cursor -- An illuminated geometric shape (often blinking) that appears on the monitor screen indicating the position of the next character to be typed.

directory -- The space on a formatted diskette that contains information used by CP/M to find files stored on the diskette. Also refers to the listing of those files.

diskette -- A flexible magnetic disk that is the primary mass storage medium of an Apple II.

display -- The visual presentation appearing on a monitor (or CRT) screen.

extension -- A code name appended to a CP/M file name that denotes a file type or other file characteristic.

format -- An operation performed on a diskette that divides the diskette into tracks and sectors and creates a disk directory.

hardware protocol -- A set of conventions governing the timing and format of data transmission.

input/output -- A general term referring to the transmission of data between a computer and an external device.

interface -- A hardware component that links a computer to an external device (usually an input/output device).

inverse video -- A mode of video display consisting of dark characters on a light field.

menu -- A list of program options in which any option may be selected by entering an alphanumeric character associated with that option.

menu-driven -- A program in which functions are selected by the user from a menu.

monitor -- A device that displays information sent from the computer or the keyboard.

motherboard -- On the Apple II, the large printed circuit board into which other printed circuit cards may be plugged.

one-wire shift key modification -- A hardware modification to the Apple II that allows the SHIFT key to provide upper case letters when the Smarterm card is active.

operating system -- The set of instructions that allows the user to perform basic operations on a computer.

parallel interface -- A hardware component which transmits or receives data bits on more than one line simultaneously.

peripheral -- An external device used by a computer to send or receive information.

printed circuit card (board) -- An insulated material with conductive strips into which electronic components are inserted.

prompt -- A character displayed by the operating system to indicate that it is ready to accept a command from the keyboard.

RAM -- Random Access Memory. A memory for which the computer may access any location in any order.

serial interface -- A hardware component which transmits or receives data bits on a single data line.

system initialization -- The process used to apply power to the computer and computer peripherals and load an operating system into computer memory.

system tracks -- The space on a formatted diskette reserved for the operating system.

toggled command -- A command used as a switch to either activate or deactivate a function.

utility program -- A program that provides a commonly used function for the convenience of the user.

version -- A number or letter used to identify the revision level of a printed circuit card or software package.

warm boot -- A term referring to the process by which computer software is re-initialized.

wild card -- A special character used in a CP/M file management command to match with all files of a category.

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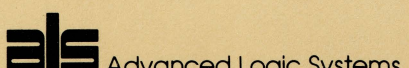

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